

# DRAGON USER

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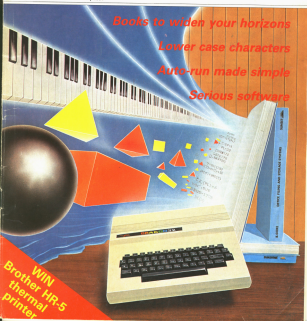
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# DRAGON USER



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Software Editor  
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Editorial Secretary  
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Advertisement Manager  
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Advertisement Executive  
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Managing Editor  
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Publishing Director  
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## How to submit articles

The quality of the material we can publish in  
Dragon User each month will, to a very great  
extent, depend on the quality of the con-  
tributors that you can make with your  
Dragon. The Dragon 32 computer was launched  
on to the market with a powerful version of  
Basic, but with very poor documentation.

Every one of us who uses a Dragon will be  
able to discover new tricks and窍门 almost  
every day. To help other Dragon users keep  
up with the speed of the development work  
of us must assume that we make the  
discovery first — that means writing it down  
and passing it on to others.

Articles which are submitted to Dragon  
User for publication should not be more than  
5000 words long. All submissions should be  
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printed on plain white paper and be accom-  
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a copy if you want to have your program  
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addressed envelope.

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petition

## Editorial

**SAD NEWS** came from Dragon Data at the beginning of June. The company announced that the receivers had been called in following "the continuing difficulties of establishing profitable trading in the UK and other parts of the world".

Obviously this threatens the future of the new Dragon Professional, previewed on page 8 of this issue. But the company says it "has confidence in its new products and the market opportunities they represent and will be using its best endeavours in helping the receivers to explore ways of continuing trading".

The company has been no stranger to stories of financial problems. It was last September that a £2½ million funding was announced for Dragon Data. At the time the company insisted that this sum was primarily an investment, but creditors saw it rather as a rescue package. At the time the difficulties were attributed partly to poor sales last summer. The message at the beginning of this June was similar but not restricted to a specific season: "The home computer market was not as buoyant as people believed." Earlier this year British Home Stores decided to stop selling the 32 and cleared its shelves by selling the machine at a bargain basement price. Rival chain store Boots, responsible for so many Dragon sales, was also expected to stop the 32 but to continue selling software for the machine.

The 32 is an old micro now in microcomputing terms and was unable to resist the challenge of newer machines. The time taken to release disk drives hindered the 32's growth while the 64, an attempt to move upmarket, was little more than an upgraded 32. A further delay, between the arrival of the 64 and the applications software to run on it, did further damage.

Sadly a wheel has now turned full circle. The 32 was developed by top-maker Microware which, faced by its own financial problems, sold rights to the machine to the newly formed Dragon Data. Last October, nearly a year later, Microware called in the receivers. Now the same fate has befallen Dragon Data.

Please note that as Dragon User is an independent publication we will not be affected by Dragon Data's financial problems.

# Letters

This is the chance to air your views — send your tips, compliments and complaints to **Letters**, Page, Dragon Street, 10-13 Little Newport Street, London WC2R 1JD.

## Maze defence

YOUR reviewers do a great job with limited time to examine all of the games they are sent, but it is a little annoying for a small company trying to do something about the quality and price of Dragon magazines, to find its offering criticised for features which have specifically been taken care of.

The reviewer of "Wildway" (software review May 1984, Dragon Issue) complained of being "squashed" too frequently by the walls of the maze, with the consequent tedium of waiting for the game to re-initialise. However, there is a command listed in the instructions which prevents this happening, and both my 7- and 4-year-old sons have no trouble in using it at home.

In fact "Wildway" was deliberately designed so that the player is rarely killed at random and should have a long playing time. The wall to re-kill them comes as more of a welcome hint.

However, and in case this should still be an irritation to some, I have now taken care of it by omitting certain sections of initialisation on subsequent games unless the difficulty level is altered. I have also now added the B&B&K key in sections where its inadvertent use would wreck the screen display, and CRT would be useless.

Jon Murray-Watson  
Hemel Hempstead  
Hemel Hempstead

## Audible humming

JUDGING by the editorial and one of the articles in the May 84 edition of Dragon Issue, it is obvious that I am not the only one to have had trouble with the Dragon cassette interface.

In my case the problem was caused by having the microphone, playback and remote lines permanently connected, which caused an earth loop (indicated by a humming when using the "audio on" command).

The solution was to use only one connection at a time (for example using only the mic-

rophone line when saving a program). This does mean that the tape has to be inserted and stopped manually, and plugs have to be changed, however, no loading errors have gone away and so I feel this is a small price to pay.

J H Cox  
Borehampton  
Dorset

## Personal problem

I AM writing to you to complain about the Pan Personal Computers News book *Early Programs for the Dragon 32*. My complaint is about the listings — some programs have lines left out and others have the wrong comments. At the price of £4.95 I should have thought that there would be no errors in the book.

If anyone has the book and has managed to correct the error in the *Games* program could they please send me the correct listing.

Philip Cox  
Croydon Park  
Leicester

WE HAVE had several queries concerning the listings published in *Early Programs for the Dragon 32* and have been in contact with Pan Books about the problems.

They agree us that they are aware of the errors, which, according to David Rowley of Pan Books, occur in five of the listings. The situation arose, he said, because most of the listings in the book were converted from other sources to the Dragon.

Pan has a full-time layout support system which will investigate possible program errors, and a correction sheet containing error free listings of

the five problem programs is available from Elizabeth Kinnel, Pan Personal Computer News, Computer Library, 10 Conry Place, London SW18.

## Mid-air escape

I HAVE discovered something interesting in Microdeal's *Camden in the Jungle* (Pott).

While running along I fell down one of the holes into the Scorpion's Domain. Then when I was climbing up a ladder I jumped off half-way (this only happens very rarely). This meant I was suspended in mid-air — it also enabled me to walk above the scorpions so they could not bite me.

Joan West  
St Albans  
Herts

ANY OTHER readers who have noticed "interesting things" happening in games, they've played should write to let us know — we'll not print about the ways we get high scores.

## Text files

AS WE mentioned in the review of Dragon Data's Record Management System (RMS) in the May issue of Dragon Issue, it is necessary to create text files for the Report and Dictionary functions, but no text editor is included in the RMS disk and indeed Dragon Data supports the use of either its Teletype word-processor or the Editor/Assembler/Debugger package.

However, even if you do not have either of these two editors (or the B&B&K disk which includes a text editor), you can still

use the BUILD command on the essential DOS system disk to prepare text files. This is not actually an editor but it does allow you to create text files, although if you make a mistake when using BUILD you have to retype the text from scratch.

This is obviously rather frustrating if you only want to use RMS, but it seems unlikely that many users will fall into that category. One of the virtues of RMS is that it is a complete interfacing system with a common file structure, which can be accessed by any utility, and we would expect users who opt for RMS to also have at least one other package containing a full editor. We trust that this explains the situation clearly.

Kath and Steven Gray  
Petersham  
Cambs

## For book worms

I WOULD like to pass on to readers the title of a book that I have found very useful in helping to understand my Dragon.

Know Your Dragon by Don Morris (published by the Tiny Publishing Company of Harlow's Heath) is far clearer and much more easily understood than the Dragon manual, which is both difficult to understand without previous computer experience and is many respects more comprehensive. My own copy came from a Tandy shop, price £5.95, but is presumably available through most bookshops.

D Horton  
Aurora  
Cambs

## Parisian pen-pal

I AM 18, live near Paris and have been learning English for five years. I would appreciate speaking for rather writing "Dragon" with a pen-friend.

We could also possibly make an exchange during the summer holidays.

My father is a microsystems engineer and I am the owner of a Dragon. My address is 4 Allée du Mail, 94420 Le Perreux-Thermes, France.

Marc Pétry  
France

## Software Top 10

- 1 (-) Cuthbert in Space ..... Microdeal
- 2 (X) Chuckie Egg ..... A&F Software
- 3 (1) Dragon Chess ..... Oasis
- 4 (7) Kriegspiel ..... Beyond
- 5 (X) Elghibell ..... Microdeal
- 6 (10) Sirenelle ..... Microdeal
- 7 (2) Hungry Horace ..... Melbourne House
- 8 (-) Sorfle Magic ..... Knight
- 9 (-) Space Shuttle Simulator ..... Microdeal
- 10 (-) Sprint ..... Oasis

Chart compiled by Websters Software





Games that come front...

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(in words or figures)

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# Expanding network

SEVERAL new user's groups have sprouted up all around the country as the Dragon clubnet continues to expand.

From Ashley Adamson comes news of the Independent Romsey Area Dragon User Group which has regular meetings every weekend and issues a free, fortnightly newsletter. For further details contact Ashley at St. Giles, 83a3 Lane, West Welles, Romsey, Hants SO5 6B.

Club Secretary J. Smith sends details of the Brighton, Hove & District Computer club which meets every second Wednesday at the Southwick Community Centre from 7.30

pm to 10.30. The club has members of all ages with a wide variety of machines and interests and you are asked to contact The Hon Secretary, 36 Leicester Villas, Hove, East Sussex BN2 5SQ for further information.

Fred Bullfield writes with news of his intended flood-side pen pals club for the Dragon. A magazine newsletter is planned and Dragon Data has promised to help with an offer of discounts on some of its products, firmquies by post should be sent to 157 Moor Hill, Quarry Barn, Steeple Hill, West Midlands DY15 2AT.

# Games and adventures

ASTROLOGICAL predictions, a simulated space walk and an invisible magic ring are all essential ingredients in the latest releases of software for the Dragon.

From Magna Software comes Belvedere Castle Adventure which has you searching through 156 locations on the trail of gold bullion. It's a Knockout, a three part game for one or two players involving overcoming obstacles as is attempted in the TV series of the same name; and Jack the Builder a 100 per cent machine code game with four different levels of play as you construct a house avoiding cement bugs and the efforts of a stone intent on demolishing your hard work.

All three subtleties cost

£6.95 including p&h and are available direct from Magna Software at 10 Pinner Road, London SE22 0LN.

"An original space shoot 'em up" is how Michael Moss of Imagine Software described Imagine's latest game for the Dragon entitled Cosmic Cruiser. Billed as a better game than Pendo (also from Imagine) the idea is to rescue colleagues held prisoner in a space station and return them safely to the space ship avoiding and blitzing all sorts of nasties that get in the way.

Finally from Dragon Data comes Astrology, which takes a serious look at the subject, with two different charts, five different house systems and requires such details as the longitude and latitude of your place of birth.



"I'd like something that could get me in touch with the World Bank before it could collapse" - you mean money, I."

# GEC Dragon moves into top gear



DRAGON DATA is moving into the top league with the launch of two new micros, project named Alpha and Beta.

The Alpha, to be marketed by GEC Dragon under the probable title of the Professional, is an upgraded and re-tooled version of the Dragon 64. It uses the 68001 processor, has 64K Ram, 140K Rom plus 64K boot Rom and will support one or two 3½ inch single sided, double density 5.25 micro drives with 360Kbyte formatted capacity, and 1000K unformatted capacity.

Display is either 32 by 16 columns in Basic mode, 51 x 24 or 40 x 24. The colour capabilities are the same as for the 64 and depend on the mode chosen. An on board programmable sound generator allowing use of three independent sound channels, and a noise channel are included.

The Professional has a cassette and joystick port, a Centronics parallel interface, an RS232, an RS485 and composite monitor socket, a 1MHz moderated signal and on

board power supply. On power-up, you are asked whether you want to use Basic or a load operating system from disk. An on board floppy disk controller gives the additional capacity to run two external 5¼ inch disk drives.

The Professional also has a built-in modem which is "going through approval" with British Telecom according to Derek Williams, Dragon Data's technical director. The machine is expected to cost about £700 for one drive and £850 for the two drive version.

The Alpha comes in one neat compact case, and is the approximate size of the 64 with an altered height to incorporate the micro-drives, it connects direct to the mains via a standard 13 amp plug.

Describing the new micro, Derek said he feels "impressed and expanded the 64 to the optimum" providing a neat package "without wires trailing everywhere". All Dragon 32 and 64 games and applications software are compatible as well as the OS-9 operating system.

New software has also been developed to run on the sys-

tem including a Rom pack or disk to access Pental and two other networking, Telecom Gold (PSS network) and Comet Electronic Mailing system (SEPL). The latter two networks enable text messages to be sent via a micro.

At present Dragon Data has an off-line editing system to generate a message without incurring phone call charges and utilizing micro-time. Once edited, instantaneous messages can then be sent. This system is to be expanded allowing for a multi-user system.

Project Beta really sets GEC Dragon hitting the big time with an expected retail price in the region of £2,500 to £3,000.

The micro uses twin 5808 chips, has 256K bytes Ram expandable to 1¼ of a mega-byte and will support two 3½ inch micro drives internally with the possibility of an external unit offering a hard disk as a replacement of one of the micro drives.

There is an on-board power supply, standard 80 column format display and an 85 load Rom load operating system from disk. The "Beta" will work with an RS232 or monochrome connection and has five different modes: the normal colour resolution of 320 by 256 in 16 colours; 640 by 512 in four colours; 640 by 256 in four colours; 320 by 256 in four colours and a teletext mode of 168 x 32 in eight colours.

The main CPU case has a fan top to support a monitor, and the product will be sold as a system incorporating monitor, CPU and detachable keyboard with separate numeric pad.

A Centronics parallel interface, RS232 serial port, mouse input and light pen facility are included. A mother card is supplied with the system which provides access to

supporting applications cards. At present there are three of these.

■ A modem system with on-line and answer capabilities, and software select baud rates of 300/600, 1200/75 and 1200 in half duplex (if demand warrants there will also be a 1200 full duplex modem system).

■ Quad serial port — an OS9 multi-user and multi-tasking system which will support a number of terminals working into the machine.

■ Network capability in order to network machines together with one acting as a file server with a hard disk of up to 80 megabytes.

Other application cards are planned for this "supermarket and extremely competitive product" according to Derek Williams. With its on-board power supply the "Beta" is a "complete working package with all the bits ready to go." Full production of the system is expected to go ahead in July with pre-production models already out.

Dragon Data is presently developing a lot of new products in order to enhance its existing range. When asked about a micro to replace the Dragon 32 following the news that Basys, the High Street retail chain, may pull out of selling the Dragon and is negotiating the future of the 32, Derek Williams would not comment further. He said simply that "we are going to stay in the High Street", while Steve Davis, Dragon Data's Marketing Assistant said that the 32 is popular overseas and that Dragon Data will continue to market the 32 as long as there is a demand for it.

Readers who want more information on the new products and who are interested on upgrading their micros are asked to contact Steve Davis of Dragon Data on 0695-744730.

## Club doubt as Dragon Dungeon goes under

AFTER months of speculation, news has been released of the demise of Dragon Dungeon.

The company, which produced software for the Dragon and ran a club magazine entitled Dragon's World, has gone into liquidation and is unable to fulfil outstanding customer orders. Details of customer creditors are in the hands of the accountants dealing with

the winding-up of the company and readers with enquiries about outstanding orders should contact Margit & Moss, 54 Ruster Gate, Loughborough, Leicestershire.

Attempts are being made to continue publication of Dragon's World by a third party and if this attempt is successful, club members' subscriptions will be honoured by the new publishers.

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Reversi is a board game for two players. It is a good way to learn more about programming and is a good way to play a challenging game.

## QUICKSAND

Quicksand is a board game for two players. It is a good way to learn more about programming and is a good way to play a challenging game.

ZIP, ZAP, zow, bang, Microdeal has launched a new range of software for the Dragon, billed as the "largest range of Dragon software released at one time". The new titles include arcade, strategy and adventure games.

Beam Rider is a high-speed arcade type game which has you jumping blocks and avoiding your pursuers, while Crash has you extending evasive action in a continuation of the King.

The nasties are after Cuthbert again as he collects fuel and food (Cuthbert in Space) and illuminates the landing pad (Cuthbert goes walkabout) in Galagon and King Tut you are presented with a sequence of five screens in order to test your reflexes and strategy (Galagon) and to journey through King Tutankamun's tomb collecting treasures (King Tut).

"A graphics adventure created with an arcade game" is how Alan Hobbs, Microdeal's Sales manager described The Touchstone, a complete adventure through different chambers in search of the sacred stone.

Catapults manoeuvre his ice blocks across the Arctic wastes squashing all interlopers in Penguin, whilst back in the sun, Mr Dig reaps in a bumper crop of cherries, apples and other assorted fruits in the game of the same name.

Continuing the range of Dragon games are Electron, Grabber and Dungeon Raid, all of which we hope to review

## Masterful Microdeal



John Symes displaying the "software key"

in subsequent issues. John Symes, Managing Director of Microdeal said that he is still heavily committed to the Dragon though Microdeal are branching out and expanding to other micro. John has taken Microdeal from "virtually nothing" — in the back room of his house — to luxury offices as the company moved up the ladder.

Combined with Microdeal's new releases are the new Tom Ible Label which Microdeal is distributing. Under this label there is Cuthbert, Katerpillar Two and Buzzard Ball, the latter game being "undoubtedly the best game out of this range for the Dragon" according to John Symes. And as if to prove it, Microdeal is launching its software key with Buzzard Ball, containing "se-

ret, uncorruptable signals" to prevent piracy.

The key is plugged in to the joystick port where it generates a combination of signals specific to each title in order to load the game. Whether or not sales drop as a result of the key is a matter of conjecture, though Microdeal are obviously hoping that a fall in sales will be matched by a corresponding fall in piracy and a rise in revenue.

Finally, Microdeal are also marketing two serious software cassettes — Programmers Utilities and Machine Language Tutorial.

Microdeal's cassettes cost £8 except Buzzard Ball and Machine Language Tutorial which cost £9.95, and should be available now in retail shops around the country.

## Machine language aid for your micro

A MACHINE language monitor-disassembler with line editor and trace facilities has been released by Micrologic Software for the Dragon.

The Ace Trace, as it is known, costs £14.95 and combines the tools needed to debug machine code programs. It is written in position independent code and can reside anywhere in the Dragon's memory map from \$0000 to \$FFFF. It enables you to trace both Ram and Rom and comes with a standard 4800 Assembler supporting all Motorola microprocessors.

The advantage of the trace is that programs are executed on the screen nearly 500 times slower than when the program is run in real time, allowing you to spot something going wrong; and the reason for any faults is displayed on the screen. To speed things up the register dump can be suppressed and recovered at any time by pressing the R key.

Micrologic is discussing with distributors the possibilities of marketing the trace and further inquiries should be directed to the company at its Island Road, Daresbury, London W93ZJ.

## Educated software

EDUCA is moving into the educational arena with the release of two programs which are part of a series of 15 titles planned for the Dragon.

The first two packs are called Lift off with numbers and Launching logic and both contain five games and an accompanying manual.

The Number games include Washing (hanging out shirts in the correct place to match colour and pattern), Gates (putting candles according to the number of dots on the die), Pickers (matching slates), Binge (making a line to beat your opponent) and Ladybirds (making the spots count up to

10).

For the logic games there is Logic Block, Pick a book, (since the engine (which is useless rebuilding the engine), Set the stake (using the coloured shapes to make a pattern) and On the right road (sorting shapes for colour, size or thickness).

The programs have been developed by Mrs. Hewlett, senior maths adviser at Ashford Maths Centre in Kent, and are for children of 5 to 8 years old. Other programs in the series will be released in batches of two throughout the year, and all cassettes cost £9.95 including VAT.



COMPETITION is on the way for Cuthbert following the news that Microdeal is to launch a high-specification 514 inch floppy disk drive.

Both single and dual drive versions for use with the Dragon 32 and 64 computers will be available at the end of July. The disk drive uses the Data disk operating system from Premier Microsystems and will therefore be in direct competition with Cuthbert's drive operating under the same system.

The single drive unit has an

unformatted capacity of 500 Kbytes (260 Kbytes formatted) and the dual drive's capacity storage is 1 megabyte (120 Kbytes formatted).

The units are presented in metal cabinets, have built-in power supply, 40 data tracks per side and 40 heads per inch. The single drive is expected to cost £325 and the dual drive will retail at £325. For further information contact Micrologic, Putney Way, Belling Road, Bradford, West Yorkshire BD4 7TG.

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# Pains and pleasures

John Sorken swoops in on the latest software

THE COLLECTION of software I looked at last month seemed to show an upturn in quality. Unfortunately, this month's selection has not been as much fun to review, although there has been the occasional breath of fresh air.

Sometimes I wonder who thinks up the names of computer games. My favourite city name this month is **Nerble Force** from Dragon Data. "You are one of the last human survivors on the planet Nerble," begins the blurb. "Your task is to prevent the Nerble Force from kidnapping the few humans on the planet's surface and rescuing any that are left stranded. As play begins, you realise that this is simply another game of Defender in a different guise."

Fresh waves of aliens swoop in from left and right, giving you little warning other than a few bips on the radar display at the bottom of the screen. You control your craft's horizontal and vertical movement with a joystick, and use the fire button to zap the Nerbles. If you are lucky you can offer timely assistance to your fellow humans, but this is by no means an easy task. Using physics means that there are no instant fatalities; however, all collisions seem to wipe everything out on the screen.

## Limitations

If you don't have a copy of Defender you may enjoy this game, but there are better versions on the market. One point in its favour is its price, as the game is only £7.95. Several other Dragon Data titles are more expensive, such as *Junior's Revenge* at £10.95, but at least that follows the complexities of the arcade version. **Nerble Force** is a rather basic copy of Defender, and a higher price could not have been justified.

**Cosmic Clones**, also from Dragon Data, appears at the outset to be dangerously close to Invaders, but I'm pleased to say that it's much more imaginative. After a whimsical introduction is rather incongruously rendered at "Pop Goes the Weasel", you can choose to use a joystick or the keyboard. If you are right-handed, the space and Q keys are used, and the cursor keys are available for left-handed users.

You can move your base across the screen, as various aliens descend from above. According to the instructions, they are called "Clonules". These change into Double Clonules if they are shot once, but increase in size if they touch the ground.

They can be shot by pressing the space bar before they have a chance to land. The documentation informs you that they change not into *Clare Rangers* or *Wig Colonial Boys*, as you might imagine, but simply "Superclonules". The order of change is Superclonule into two Clonul Bombs, and Clonul Warrior into two Double Bombs, so several direct hits are necessary to destroy them completely. At the while, a line across the screen shedding lethal particles gets lower and lower until there's no room left to manoeuvre.

I wasn't very happy about the dubbing that poured in a constant stream from the TV, but the game itself is not bad, and certainly worth looking at.



*Cosmic Clones, more imaginative than Invaders*



*Nerble Force: Defender in a different guise*

A recent name in the ranks of software houses is Galactic Software, the publishers of several programs including **Froggy** and **Bug Diver**. Froggy is, as one would expect, the game of Frogger, which has already appeared in several versions over the last year or so. As is usual, you have to steer a little frog across a road, on to logs in a river and finally become an fly path to safety on the far side. This version is reasonably fast, and the smiling frog faces as they reach the other side of the river are quite good, but the game uses the keyboard for control and this makes it very frustrating to play. It is possible to enter

games that respond to instant key presses, but the way the Dragon operates means that it can be easily doing something else just at the moment when you press a key. Games that use key presses for control need to take this into consideration or else use a different method for scanning the keyboard. Some word-processors for the Dragon are like this, and you lose letters if you type too quickly, but it's only irritating when it occurs in a fast game.

**Bug Diver** suffers from the same problem, and unless you fully release a key before pressing another, the Dragon won't respond to the new key. The game is a rather simple affair of steering a beetle down a screen of fast-swimming bats to steal their eggs from the ocean floor. You then have to rise to the surface with them, where they can be safely deposited in a waiting speed-boat. The game is fairly novel in concept and you need to be quite skilful to succeed, but it's not as refined as recent programs from the larger software companies.

## Topical

Talking of large companies, or at least those with impressive catalogues, it's been a couple of months since I've seen anything from Microdeal for the Dragons. They have recently increased the number of machines they supply, and the large quantity of new Dragon software from the States seems to be drying up, although they still have a range of nearly one hundred titles. They must have realised that I was going away to Cullbert, as a tape of his new and highly topical escapades arrived this month.

Starting with a burst of "Chestnut" from the TV, **Cullbert in the Mines** shows poor Cullbert at his lowest ebb. Along with some friends, he has been captured by the Moronians, and they have been forced (by the MOBS?) to work in the mines, from which they constantly attempt to escape. The screen display shows the different levels running underground, with trucks passing along rails. Using a joystick, you control little figures that can run right or left and also jump from one level to the next. Adding to your confusion is a device called MacDrogon?, who climbs a ladder on the right-hand side of the screen. Every so often, he releases a fireball which must be avoided at all costs. If this catches the figure, it descends rather rapidly to the eternal flames that lie at the base of the display.

The graphics are good, and the responses to the joystick very smooth. Although I still prefer Cullbert in the Jungle, this is an entertaining game and well worth £8. The only thing missing in this game is a cluster of pickling onions, but I don't suppose they have the benefit of onions in Moronia.

A firm that is better known for its IBM software is AMF Software. Like Microdeal, they have apparently decided to diversify, and have included the Dragon in their list of micros. **Chuckie Egg** has an unusual setting — a lampshade. The object of the game is to obtain as many eggs as you ■

# SUPER HEROES

## PAST AND PRESENT

From the P&F we introduce QUAZIMODO the Hawkhawk, in his efforts to rescue the dammed from her ferocious prison. You will need to jump the perimeter, cross the moats, escape the fire bells and escape the guards to succeed in this task. 10 screens and 4 difficulty levels will present a great challenge. A joystick is required.



Our PRESENT also has a FLOPPY, the first winning book of the Golden Computer, who plays in the SUPERBOWL, knowing that all his talent will be needed to avoid the increasing difficulty situation of the Washington Redskins. This brilliant and original simulation of American Football starts with the kick-off and the ball hanging in the air as Pined jumps to catch it. With long passes, yards passed here for yards to go and his catch is a clean one? If he catches it, how far can he run before the mighty arm of Washington brings him to the ground? This format is perfect as it gives a totally unique and like no other you have ever seen or played before. A joystick is required.

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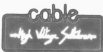
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—I can while awaiting strange creatures that seem to invade the turn. The display consists of several levels connected by letters. The eggs, along with small piles of corn are lying on the ground. As you make your way around the farmyard, you can pick up the eggs and gain points. There are some rather mean-looking ducklings scurrying about the screen just waiting to pounce on you, as well as a mischievous duck in a cage at the corner of the display. According to the program notes this is capable of producing mayhem in the peaceful farmyard, but it has just to do anything unpleasant to me!

## Farmville

Up to four people can play at the same time, and the scores are clearly shown on the display, as is a clock, quietly ticking away. When you have collected all the eggs on one screen, the display scrolls smoothly upwards, and you are faced with yet another section of the farmyard with slightly more complex surroundings. The game is very well written, and the difficulty levels are nicely gauged to allow steady progress through the different stages. There is a list of the top eight scores at the end, as well as the opportunity to redefine the control keys. If A&P Software can produce more programs like this for the Dragon, it will be no bad thing. This has to be my favourite program this month.

One program with a lot of potential is called *If I Had A Million*, from Phoenix Software. As might be guessed, this is a version of Monopoly, but with an original twist. There are two cassettes inside the packaging: one, called the *Adagio* game, consists of the usual property trading game. All the well-known London properties are there, including Old Kent Road and Pall Mall Lane (but not, I noticed, Little Newport Street). If you are lucky enough to win a game, as well as amassing at least £20,000, you are given a code word that has to be remembered. The usefulness of this is not obvious until you try to play the second cassette, the *Adventure*, and discover that you need the code to get started.

This game consists of six reels, during which time you have to convert a borrowed million into five million. You can invest in stocks and shares, buy old houses and rent them out at extortionate rates or invest in West End musicals.

I found the first cassette rather dated — you can never see the whole board at any one time, and there is no facility to play against the computer. This is only used to throw the dice and display the positions. At the end I had just been given the code word when the program crashed, which was a little disappointing. Both programs flash instructions up too quickly, and it's easy to miss important messages. As people read at different speeds, there should be some, thing like, "Press the space bar when ready".

The second program had a more original setting, and is actually in two halves. At the end of the first section, the new code word was flashed on the screen so quickly that it was impossible to read, and I had to

stop the program and go through the listing to see what I had missed. It's a shame that the programs are marred by these little faults, as they could have helped present an old game in a new format.

When you buy a computer, there are bound to be things about it that you find disappointing — no lower case, no printer port, no disk interface, no monitor connections, and so on. The Dragon, although it has many fine features, is deficient in some respects, and this is where other manufacturers can help out with a range of utilities that aren't there in the original machine. Two such programs have come my way this month.



Reach the safety of the lily pads in Froggy



Cutback at work in Cutback in the Mines



Good graphics from Microdeal

The *Animator* from Screenplay is a graphics package designed to give you access to sprites or large user-defined characters, similar to those available on the Commodore 64 and Atari machines. The program is menu-driven and gives you the option of defining up to 24 different sprites, selecting or translating them and saving their definitions on tape. The defining is

achieved on a large grid, and the new sprites can be used in your own programs. Controlling the sprites is rather tedious, as you need to PEEK and POKE the memory locations where the routines are stored. Although this may appear time-consuming, it is the method used on the Commodore 64.

The effects that can be achieved can be spectacular, but it's a pity that a look-up table of new words could not have been written into the software to make the programming job a little simpler. There are demonstration programs included, and the *Animator* is well-documented. If you are prepared for a little effort, this package could prove useful, and the price of £9.95 is a lot less than some cartridge versions.

*Rainbow Writer* from Microdeal is another attempt to get over the Dragon's limitations in the area of graphics, and is termed a "screen enhancer". This program uses extra print statements to hold control codes for up to 224 new characters. There are more than enough of these for most purposes, including lower case letters, tenses, accents and Greek symbols, but should they prove insufficient there is an option to define your own. Display modes can be altered, and it is possible to have up to 64 characters in one line, which is useful for word processing, or to get the other way and have only 16, which is useful for games. The documentation is clear, although there are helpful messages on the screen itself. One of the best features is that you can include all the results of the program in your own software (and even market it commercially provided you inform Microdeal).

## Languages

Just as there are many human languages, so there are several ways of communicating with computers. At the simplest level, computers understand machine code — a series of binary numbers that stand for both instructions and data. To make this more meaningful, there is assembly language that makes slightly more sense. These are low level languages; they are called high level if they get closer to human natural language. Basic is a high level language, because the command set is close to English (for example, you can simply say PRINT "something" and "something" appears on the screen).

One problem with a language like Basic is that it is interpreted into machine-code instructions when you type RUN, and this slows down the speed. This isn't important in many applications, but it can be irritating when you are trying to write high-speed arcade games. There are several options open to Dragon users who want to overcome this problem:

- 1) buy a good assembler package and learn to program the 68000 directly;
- 2) compile your BASIC programs; or
- 3) use a different language to BASIC.

I have reviewed several good assemblers in the past, but in this article I'm going to look at the second and third ways of speeding things up.

As I stated before, most microcomputers

## EDIT+ - A true Utility

Some 'Utilities' are really not very useful when you come down to it. To be genuinely useful the software has to do something quite special - it has to be a real improvement over the way that you do things now and be convenient to use. We looked at the DRAGON. The facilities for program development are primitive and the display is a pain. It could even put you off programming for life.

EDIT+ is a real improvement for the DRAGON. It allows you to develop programs quickly and easily whatever they are for. In addition EDIT+ includes HIRES, an enhanced screen display with 24 lines by 51 characters, selectable character sets (English, French, German, Danish, Swedish, Italian, Spanish), Sprite graphics, replaceable characters, and an improved keyboard action with auto repeat. Graphics and text can be mixed on the same screen. To use EDIT+ you either plug in the cartridge or load the program from disk. Tapes are fine for games - not for something you will use over and over again. Programming can be pleasant - try EDIT+ and see how. It may even help you to make proper use of some of the other 'utilities' on the market.

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We were rather proud when Ian Sinclair chose our assembler and monitor for his book, 'Introducing Dragon Machine Code' and thrilled by his description of DASM as 'The Little Prince of Assemblers'.

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► use interpreted Basic, with translation into machine code taking place at run-time. A compiler is a little like a turbo-charged sausage machine. After writing your Basic program, you feed it into the compiler and it comes out converted into machine code. Once it has been compiled, it cannot be edited or altered, so two versions need to be kept in case of changes at a later stage.

There are several problems that occur when using compilers. First, they take up memory space in the host computer, so full-length programs cannot be compiled, and secondly, they usually cannot compile a complete set of the Basic language: they frequently have problems with decimals and string variables. If you can live with these small deficiencies, most packages show a substantial increase in speed, and could prove faster than learning machine code.

## Compiler

Cass Software from Weston-Super-Mare produces a compiler for the Dragon called **Sprint**. Amongst its strict case associated with Pascal, it is a well-documented program that compiles most Dragon programs. It has a few drawbacks, but these are mostly surmountable. Although it will only accept integers, you can use fractions to represent decimals. For example **CIRCLE** commands can use 8.5 by entering **32/154**. The **X** parameter in **DRAW** and **PLAY** commands will not work either, but there are notes in the documentation to explain how to get round this.

The documentation itself is very full, and consists of 186 pages of clearly set text. Although it seems fully complicated, the procedures are clearly explained, and there are clear diagrams to try out. After the initial compilation into an intermediate code, a list of errors appears on the screen, or can be directed to a printer. When these have been corrected, the final compilation takes place and the finished program can either be executed or saved to cassette. The package includes two cassettes, one containing the compiler, and the other a demonstration program in both Basic and compiled versions. There is a graphic version of 3D routines and cassettes with title screens as the prices and it demonstrates well the usefulness of the program.

Learning another language to increase speed might seem rather an intimidating task. In fact, just as you can use a small set of Basic words and gradually build up your knowledge, so you can learn other languages at your own pace. Informal sets a version of Fort for the Dragon called **Teleforth** which carries in a bulky A4 folder like its Teletexter word-processing package.

When you come to learn Fort, it is probably a good idea to empty your mind of previous programming ideas. Whereas a Basic program can be seen as a logical flow of operations with control passing from one line to the next, like a list of things to do on a shopping expedition, Fort is based on defined words that are made up

of primitives — words that talk directly to machine code routines. When you begin to use Fort, these words are used as building blocks to form new words which are used in turn to define others and so on.

Eventually you end up with one word that defines the program, like the top stone in a pyramid, resting on all the others. In fact, the interconnections between words are usually more complicated than that, and because the action threads its way through the words, Fort is described as a "threaded interpreted" language.

<b>Merle Force Cosmic Clones</b> £7.95 each	<b>Dragon Data King's Rats</b> <b>Margan</b> <b>Fort Taster</b>
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<b>Sprint Compiler</b> <b>Porte Pascal</b> £19.95 each	<b>Cass Software</b> <b>16a Alexandra Pde</b> <b>Weston-Super-Mare</b> <b>Avon</b>

There are two main versions of Fort, Fort 79 and **tgFort** from Fort Interest Group. The Microbit version is closer to **tgFort**, although it has been adapted to take advantage of the particular features of the Dragon. It is a pity that there isn't a demonstration tape of how these features are used in new Fort words or how they put full screen movement into your definitions.

The manual that comes with Teletexter is about 80 pages long and gives a complete list of **tgFort** words together with all the new words that are specific to this version. Apart from that, it simply tells you how to define words, save and load programs, and gives an introduction to arithmetic in Fort. As it stands, it's more of a technical manual rather than an instruction guide which means you will need to buy a separate Fort tape. This does not imply too many problems, however, as there are several Teach-yourself Fort books on the market, and the machine differences are

by no means as large as those in, say, Basic. A more serious criticism is that of the choice of colour of the paper in the manual. This is jucky brown, and the text is in black, which does not aid legibility.

All versions of Fort will give you a large increase in speed and Teletexter is no exception. The error messages are laid out clearly, and Fort's relatively helps you think clearly, which will improve your programming skills in general. It seems that Fort is destined never to take off in a big way, but this shouldn't put you off adding this package to your collection.

The other alternative language to Basic available for the Dragon is Pascal. Although not in itself any faster than Basic, it is a compiled rather than an interpreted language, and so it tends to run faster at execution time. The producer of the Sprint Compiler, Cass Software, also produce a version of Pascal called **Porte Pascal**. It has to be a rather small set of the complete version, as it has to reside in memory along with any programs that use it, but anyone becoming proficient at using it would have no trouble in transferring to a full version of Pascal on a larger computer.

Some of the commands in Pascal are similar to those in Basic, and several recent versions of the latter, such as that for the BBC machine, have borrowed a lot of the structures. It's only fair to point out, however, that many people find Pascal fairly difficult after Basic. Once you succeed in writing the initial program, it is compiled by entering **RUNC**. Errors are detected in much the same way as in the Sprint program, and are not always easy to correct.

## Error tracking

I've always found error tracking in Pascal a tedious business, but **Porte Pascal** is no worse than many others in this respect. The need to define variables and so on at the start of the program is probably a good idea, and forces you to construct elegant programs. Unless you know exactly what your intentions are right at the start, the program is unlikely to ever become properly. The compiler produces an intermediate code called P-code, which is entered on a stack and interpreted at the time of execution.

The documentation is contained in a 48-page mini-booklet and is very clear in what can be a complex subject. As well as copious information, it contains many example programs and there is also a demonstration cassette. You would be well advised to buy a supplementary tutor to back up these aids, however, as Pascal needs a far more structured approach than Basic. If you are interested in learning Pascal, this package is an economical way of achieving your aim, and can certainly be recommended.

The serious software this month has in general been of a much better standard than the games programs. I hope that they will encourage programmers to improve the quality of the entertainment side of the industry. Next month there should be some sequels to old favourites, and that will provide some bites worth waiting for. ■

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**TEDPDU**

# Specialised databases

*Keith and Steven Brain examine more business system software and applications for the Dragon.*

IN THE MAY '84 issue of *Dragon User* we took a look at a number of "serious" applications programs for the Dragon, and in this issue we peer more closely into offerings for the small business world. However, as a couple of database programs arrived too late for our earlier review we will make brief comments about them first. (Photocopies of our previous article can be obtained by sending a large SAE to *Dragon User*.)

Salomander's **DRS** (Data Retrieval System) is available on cassette, but with full instructions on transferring the program to the Dragon DRS disk system. Cassette data files can each hold 22,000 characters and on disk up to seven segments of 22,000 characters (154,000) can be treated as a single file, but with each segment being processed in turn in RAM. Maximum record length is 400 characters with a maximum of 30 fields.



It is possible to "design" your own screen layout with a full-screen editor similar to that described previously in connection with Microsoft's **Fimsuit**. (Quitting DRS does not affect the workspace so that system commands (such as DR) can be made and then you can jump straight back into DRS with **EXEC** (provided that a checksum test reveals that you have not succeeded in corrupting your file inadvertently).

Bussoft is offering tape and disk versions of **Sugar Software's TMS** (Tape Information Management System). This is mainly written in Basic but with machine code routines built-in for sorting, and is a pretty standard database program.

One application of general database programs is the maintenance of address files and mailing lists, but specific programs dedicated solely to these functions are also available. These are more user-

friendly than normal databases, but, as they are restricted to this single application, they are mainly of interest to users with limited objectives who do not have the confidence to set up their own system.

The cassette-based **Mailing List** (Abacus) stores names, addresses and telephone numbers and also allows six user tables, which may be used to select groups of entries, to be included in the record, and alphabetical sort by name is provided.

**Mail/Address Book (MST)** is available on cassette or disk. Only name, address and telephone number are recorded and enquiries can be made by name or address. If a match with the searchkey is not found then you can obtain a list of partial matches which may contain the record you seek. Records can be printed out and an **area search** option allows you to produce a print-out based on partial matching of records (for example, town or country).

## Great expectations

Another popular type of specialised database is the stock management system which allows a trader to easily keep records to be made in good time and allowing more efficient use of the stock available. Offerings in this area range greatly in price and of course you must always remember that you tend to get what you pay for so your expectations should be in line with the cost, although you must also consider how tight your stock control needs to be.

We have certainly seen microcomputer stock control systems employed in small retail businesses where they had no hope of ever being cost-effective, as the time spent in entering all the transactions was much greater than that required to simply look for gaps on the shelves! Standard minimum features are creation of a stock file, addition of stock, reviewing stock levels and value, and producing reorder lists.

Of course a cassette-based system is slow to load and inevitably rather limited, but the Abacus cassette does provide the fundamental essentials in an inexpensive package which is probably worth experimenting with if your requirements are limited or you are not sure whether a stock control system can help you. The **MST CD Series Stock Control**, available on cassette or disk, has similar capabilities — but if you have a disk available then perhaps

you should be looking further up-market. **MST** also has the **Stock Control System** in its "professional range" which also copes with stock taking and will produce a shrinkage report.

Finally, at the top end is **Dragon Data's Stock Recording System** running under DRS. Of course this does not look exactly cheap, although it must be remembered that the price does include a detailed 80-page manual which clearly explains the workings of the system with the aid of numerous screen layouts.



The system uses the 81-column screen so that there is much more room for text on screen, true upper and lower case are produced, and transactions can be dealt with in much more detail. For example, "issues" can be classified as Sales, Returns, Returns to Suppliers or Scraped, and "stock reports" allow for Stock taking and valuation, Slow Moving Items, Re-order Lists and Usage History.

Records of purchases and sales are essential in any business, and once again the range of available packages is wide. Fundamental essentials are preparation and recording of invoices and credit notes, recording cash receipts, and preparation of reports such as statements, aged debt analysis, daybook and so on. **Abacus** offers an inexpensive cassette with a **Purchase Ledger** on one side and a **Sales Ledger** on the other, which will cope with 60 accounts and 200 transactions on the Dragon 32.

**MST CD Series Invoices/Statements** is essentially a formatting program which has rather more limited capabilities concerning preparation of "billy" invoices, whilst its more expensive "professional range" **MST-Exec** contains the invoice statement formatter with a mailing list program, where output can be spooled to disk for later printout to speed up processing time. However, these two **MST** ■

• offerings do not keep transaction records so you must do the real hard work elsewhere.

Micro Business Centre has produced a Dragon version of its established Apple Sales Ledger System (part of an Integrated Business System), which is more likely to impress your accountant, but once again it is a Dragon Data at the top of the pile with its **Sales Ledger** and **Purchase Ledger** (both sides) which also feeds from Computer Support Services, and operates on the 50-column screen.

### Keeping track

If you want to try to work out where the money is going then even more records may be needed to keep a track. Abacus ticks off at the bottom once again with the separate **Cashbook** and **VAT Accounts** program on a single cassette. The first deals with keeping records of sales and expenditure, whilst the second produces your quarterly VAT return in the form "preferred by the VAT Office" (can't that dripping with blood?), and includes a facility to print.

For the smaller business which is exempt from VAT, Abacus provides **Mini-VAT Accounts** which provides quite a comprehensive package of receipts and facilities, up to and including production of trial balances and a profit and loss account taking into account depreciation.

MST's **Business Accounts** records sales, expenditure, and bank accounts and includes facilities for printing out lists of creditors and debtors.

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Dragon Data's Computer Support Services' **Cash Book** and **VAT Register System** will probably look very familiar to anyone who has worked into the small hours with their quill pen over their "Simplex" books! Having slaved away in such fashion ourselves we can appreciate the value of "familiarity" with the system and reckon that most small businessmen should have no problem adapting to this system.

Finally, Always provide a **Payroll** program which should be of interest to the business with a small number of staff, as it automatically carries out all those tedious income tax and National Insurance calculations and produces proper pay slips for each employee. All the tax and NI data is described in detail in the program so that the arrival of a new budget does not mean the end of the usefulness of this program.

### Take the plunge

Our overall impressions were that a useful range of business programs are available for the Dragon. For those unsure whether they should dip their tender toe into the shark-infested waters of computerised accounts for the first time, the series of Abacus offerings allow you to gain first-hand experience without breaking the bank.

On the other hand, if you are ready to take the plunge into deeper water, the integrated series of very professional and well-documented packages from Dragon Data have a lot to offer, provided that you are already running DOS. ■

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**Datapen**





7701	00100	DATA	0000	END HARVEST	7773	00000000	DATA	00000	00000
7710	00000	DATA	0000	END HARVEST	7774	00000000	DATA	00000	00000
7713	00000	DATA	0000	END HARVEST	7775	00000000	DATA	00000	00000
7714	0000000	DATA	0000	END HARVEST	7776	00000000	DATA	00000	00000
7717	00000	DATA	0000	END HARVEST	7777	00000000	DATA	00000	00000
7718	00000	DATA	0000	END HARVEST	7778	00000000	DATA	00000	00000
7719	00000	DATA	0000	END HARVEST	7779	00000000	DATA	00000	00000
7720	00000	DATA	0000	END HARVEST	7780	00000000	DATA	00000	00000
7721	0000000	DATA	0000	END HARVEST	7781	00000000	DATA	00000	00000
7722	00000	DATA	0000	END HARVEST	7782	00000000	DATA	00000	00000
7723	00000	DATA	0000	END HARVEST	7783	00000000	DATA	00000	00000
7724	0000000	DATA	0000	END HARVEST	7784	00000000	DATA	00000	00000
7725	00000	DATA	0000	END HARVEST	7785	00000000	DATA	00000	00000
7726	00000	DATA	0000	END HARVEST	7786	00000000	DATA	00000	00000
7727	00000	DATA	0000	END HARVEST	7787	00000000	DATA	00000	00000
7728	00000	DATA	0000	END HARVEST	7788	00000000	DATA	00000	00000
7729	0000000	DATA	0000	END HARVEST	7789	00000000	DATA	00000	00000
7730	00000	DATA	0000	END HARVEST	7790	00000000	DATA	00000	00000
7731	00000	DATA	0000	END HARVEST	7791	00000000	DATA	00000	00000
7732	00000	DATA	0000	END HARVEST	7792	00000000	DATA	00000	00000
7733	0000000	DATA	0000	END HARVEST	7793	00000000	DATA	00000	00000
7734	00000	DATA	0000	END HARVEST	7794	00000000	DATA	00000	00000
7735	00000	DATA	0000	END HARVEST	7795	00000000	DATA	00000	00000
7736	00000	DATA	0000	END HARVEST	7796	00000000	DATA	00000	00000
7737	00000	DATA	0000	END HARVEST	7797	00000000	DATA	00000	00000
7738	00000	DATA	0000	END HARVEST	7798	00000000	DATA	00000	00000
7739	00000	DATA	0000	END HARVEST	7799	00000000	DATA	00000	00000
7740	0000000	DATA	0000	END HARVEST	7800	00000000	DATA	00000	00000
7741	00000	DATA	0000	END HARVEST	7801	00000000	DATA	00000	00000
7742	00000	DATA	0000	END HARVEST	7802	00000000	DATA	00000	00000
7743	00000	DATA	0000	END HARVEST	7803	00000000	DATA	00000	00000
7744	00000	DATA	0000	END HARVEST	7804	00000000	DATA	00000	00000
7745	0000000	DATA	0000	END HARVEST	7805	00000000	DATA	00000	00000
7746	00000	DATA	0000	END HARVEST	7806	00000000	DATA	00000	00000
7747	00000	DATA	0000	END HARVEST	7807	00000000	DATA	00000	00000
7748	00000	DATA	0000	END HARVEST	7808	00000000	DATA	00000	00000
7749	00000	DATA	0000	END HARVEST	7809	00000000	DATA	00000	00000
7750	0000000	DATA	0000	END HARVEST	7810	00000000	DATA	00000	00000
7751	00000	DATA	0000	END HARVEST	7811	00000000	DATA	00000	00000
7752	00000	DATA	0000	END HARVEST	7812	00000000	DATA	00000	00000
7753	00000	DATA	0000	END HARVEST	7813	00000000	DATA	00000	00000
7754	0000000	DATA	0000	END HARVEST	7814	00000000	DATA	00000	00000
7755	00000	DATA	0000	END					

## SPEECH and ADVANCED SOUND

# Versatile Dragon

*Join up Geyron's simple solution to enhance the quality of your creativity*

ONE OF THE big drawbacks of the Dragon, and one which puts many people off the machine at first sight, is its rather limited text screen with no lower case letters available (and that horrible green background colour! Also limiting is its inability to mix text and graphics.

Although it is possible to define individual characters as needed in individual programs, this is a tedious business at the best of times, as you have to type in those long strings every time. To remedy these drawbacks, I have devised a simple solution.

The approach I have taken is to write a program which I load into the computer before I start writing every new program. This provides me with a complete ASCII character set which I can use freely on the graphics screen. All the characters are produced using the versatile DRAW command.

The DRAW command, as implemented on the Dragon 32, is particularly powerful because of the way in which sets of instructions for use in it can be held in strings. Because of this they can be easily predefined, and called when needed.

All of the ASCII characters were defined on a 5 × 9 matrix of dots and translated into a string of instructions for the DRAW command to be used at the 5 × 9 pixel level. This means that when used enlarged by the scale function, single characters will only be clearly seen when PMODE=1 is used.

At this level it is possible to have a 50-character line, with about 20 lines on the screen. It is easier to read the characters when they are drawn in black on a white (null) background. This is achieved by calling the SCREEN1 command, clearing to white using PCLS1 and setting COLDFG=1.

It is also possible to enlarge the character size up to 15 times using the scaling instruction within the DRAW command. When larger characters than the minimum are required, it is preferable to use one of the lower resolution modes — PMODE3 for colour, PMODE2 for black and white.

Still further "fiskering-up" of the lines is achieved in PMODE3, 1 or 2. When operating in one of the coloured PMODEs it is possible to specify the colour of the drawn character by using the colour changing instruction of the DRAW command. This means that the letters can be in differing colours within a word, or that

different words within a sentence can be different colours.

Similarly, the ANGLE instruction can be used to control the orientation of the character. This is useful for labelling the axes of graphs, for instance, because of the necessity for vertically-written labels.

Once the characters have been defined, you have a system which is more powerful than that available on other home computers which enable the mixing of conventional text with graphics. The speed at which the characters are drawn is slightly faster than the normal reading speed of a child and is quite pleasant to read.

The strings, which are used in a subroutine containing the DRAW command, are contained in a string array A\$(n). The subscript "1" has been set as the ASCII value for that character minus 32. This is because all ASCII printed characters start at 32 (decimal).



This now means that calling any of these strings in the array simply needs the calculation of the ASCII value of the required character. Defining the strings only had to be done once, and that was it!

The versatility of the DRAW command can now be made use of. Size, colour and rotation changes of the character can easily be brought about. All the work is done by two subroutines to be found at lines 1000 and 1100. The program listing also includes demonstrations of how the subroutines may be used within programs.

The first demonstration starts at line 2100 and runs to the end of the program. The actions performed are explained as follows:

**Line 2110** sets the screen to the highest resolution, clears the screen to white and selects black as the printing colour.

**Lines 2120-2180** set all the variables.

The variables needed are as follows:

**X** = Horizontal position of the left-hand edge of the first character in the string to be printed.

**Y** = Vertical position of the first line at the level of the base of the capital letters. (That is those without descenders.)

**X2** = Horizontal steps between characters.

**Y2** = Vertical steps between lines.

**SC** = Scale of print size. Minimum value of "4" gives the smallest size of character. (These are drawn on a 5 × 9 pixel rectangle on the highest resolution setting.

**PMODE4**) Any value up to 62 may be used — this will give very large letters, 10 times the minimum size. Suitable values for X, Y, X2 and Y2 must be chosen for each scale change. Attempting to use values of less than four, only gives incomplete characters.

**AN** = Angle of printing. This is normally set to "0" for ordinary horizontal printing but will need to be changed, for example, to label the vertical axis of a graph. Values to be used are as follows:

"0" = 0 degrees of rotation

"1" = 90 degrees of rotation

"2" = 180 degrees of rotation

"3" = 270 degrees of rotation

**CO** = Colour to use in printing. Set to "0" for black on white screen, otherwise use the appropriate Dragon 32 colour code for the PMODE in use at the time.

**Line 2190** the string to be printed is defined as L\$, and then the printing subroutine at line 1000 is called. This subroutine in turn calls the character printing subroutine at line 1100 each time a character is to be printed.

**Line 2210** sets the variables for the next string to be printed. Note that only those variables which need to be changed in value need be redefined. In this case only the horizontal starting position and the level of the line need be redefined as all the other values stay the same.

**Line 2220** defines the next string to be printed. The printing subroutine is called in line 2230.

**Lines 2240-2320** give a few examples of how different sizes, colour and thickness of printing may be obtained using different PMODEs.

## String printing subroutine

**Line 1010** sets the number of loops to the number of characters in the string L\$.

**Line 1020** decomposes the string L\$ one character at a time and then defines which of the array A\$(n) is to be used for the drawing of each character. As all the subscripts used in this array are related to the ASCII value of that character then the ASC command is used.

**Line 1040** moves print position up one character, the next line checks to see if the line is full and if it is then it sets the horizontal position back to the right-hand edge and moves down to the next line.

## Character printing subroutine

**Line 1110** converts all the numerical values into their corresponding string representation for insertion into the DRAW command string used to draw the character in line 1120.

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### Direct testing routine

At line 1000 another routine is provided to demonstrate another way in which this array of ready-defined characters may be used to type directly on to the graphics screen from the keyboard. This will use the " " at the beginning of line 1000, which is removed before running the program.

Although not obviously a very useful volume this section has some interesting points to it. It could of course be used to create a screenful of text which could subsequently be dumped as a graphics without printing very large letters if the SCALE value is set accordingly.

It could also prove quite useful where text could be typed on to the graphics display with the images of words subsequently stored using that man-machine GUT command. A detailed explanation of the machine will explain how it works.

Line 9540 puts us in high resolution screen with black letters printed on a white background. This is the easiest mode in which to read the small letters.

Line 10:10 sets the starting point for motion in the scene.

**Line 1820** samples the keyboard to find out if a key has been pressed, samples memory location 337 (decimal) for use in line 1860 and sets a flashing screen cursor on the print position. Exit from this line only occurs, if a key has been pressed.

Line 100 checks to see if key pressed is -ENTER-. If so then GOTO 100 is performed in order to start the next line.

Line 1040 checks if back-price has been pressed and if so causes a single back-space and the add for the total character.

**Line 1040** checks to see if <CLEAR> key has been pressed and if so returns us to the plot to clear the screen and start again.

**Line 1568** sets the appropriate subscript value to select the correct character string from the characters array `ASin()` and converts the values of `X` and `Y` to their string representation.

**Line 1570**-check to see if a letter key has been pressed and if so cause a jump to 1650

Line 1688 checks to see if an AECN value of greater than 123 has been detected. This should never happen!

**Line 1000** draws the character, and the following lines increment the grinding position by one, check for end of a line and, if found, increment the line down one position while returning the horizontal position to the extreme right-hand side of the screen.

**Line 1658:** if any of the values listed are to be found in memory position 33? decimal (sampled in line 1520) then the `<SHIFT>` key has been pressed and the strings to 04444 capital letters, or a "shift" is required.

### Water characters

Some extra characters to those available on the standard Dragon 32 keyboard are also provided. On line 128 the first definition string provided is that for a basic

"#", however, included in the REM at the end of the line is an extra thing to draw a pound sign. This is made available simply by closing the first part of the line up to the

Lines tried to fix certain things to draw the following conclusions:

**Line 890:** a left-hand square bracket which is equivalent to the ASCII 91 (dec) character and is available on the Dragon keyboard using a =SHIFT= +down function.

Line 700: right-hand square bracket  
 (ASCII 93) — a <SHIFT> <right-hand

Line 210: is circled (ASCI 14) —

Line 720: underline (ASCII 95) —

A listing complete with all Fillets and explanatory notes is given, which if typed in cassetts will work well.

Once the principle of the Union is understood then all of the lines from 2900 to 3000 may be deleted along with the explanatory notes provided on lines 1690-1815. This base program can then be saved and subsequently loaded each time it is necessary to examine these lines for further assistance.

I have found this program to be invaluable. Should anyone wish to save themselves the tedium of typing in all those strings correctly then I would only be too pleased to supply them with a copy of the program on cassette if they send £5 to Jim at Gwynn, Plas Trefriys, Llangynydd, Aberystwyth, Ceredigion, Wales, SY23 3AB.

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**Keywords:** child sexual abuse; disclosure; self-blame; victim blaming





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1000

When you want your figures to move it is important to animate them to mimic real actions. Keith and Steven describe a number of ways in which this can be done. By far the smoothest, especially where speed is to preserve a background across which the character will pass, is to use PUT with logical *delta* parameters. A running figure is made to jog across a fixed screen as the authors demonstrate the sequence of actions necessary to preserve both the runner's motion and the background. The degree of realism in animation depends on the accuracy of the frames, of course, but also on the number of frames in the sequence. A six-frame trot in flight touches down very nicely to end the question.

You can turn your Dragon into a sound synthesizer, reconfiguring the keyboard and creating sound envelopes; or use the graphic music editor to enter a piece of music, display it in standard musical notation and then play it back. *Advanced Sound* & *Dragonfire* really takes you beyond basic. It shows you how to POKe into memory and modify a program while it is still running (for example to change an action parameter in PUT) and consequently achieve savings in memory retail. It also takes you to the esoteric, teaches you to totally POKe where you broke last POKe'd before (see *Dragonfire*).

This program is cannibalised from one in which the authors show you semigraphic modes 8,16 and 34. They go on to introduce the calling of machine code subroutines from within Basic programs and give a few to type in either by means of a given assembler routine or through a commercial assembler. The first ones give some simple sounds and set up a "sound table" so you can define "phrases" and "japs" to be called from memory. The last section, or just part of it, can be converted to

[illegible]

† combined program listing from Advanced Search & Analytics, Atlantic Researcher module

another routine, a partial FGLS can be achieved and the help screen can be scrolled up and down by others.

This excellent book will take anyone who is familiar with the machine to the stage of relative code programming as it just deals with the most potential. It is light enough to read tucked up in bed, yet contains sufficient meat to keep lusting your Dragon and help you out of a dillyhole. One of the magic things about computing is the speaking-of effect. Once you find out how to do something it is hard to stop before ideas come flooding in as to its applications. This usually then leads to even more questions... *Advanced Sound & Graphics* can be relied upon to supply the answers.

If, however, you are into the truly technical then you are going to demand more than just programming advice. The nature of the machine itself is the back-story to inside the Dragon by Duncan Green and Ian Sommerville (Addison-Wesley Publishers): a book for the hobbyist, enthusiast. The micro-bull will find everything laid out bare in 366 pages of solid detailed print — not one photograph in between — exploring every aspect of the hardware.

The authors' complaint as to the weak descriptive documentation provided with the machines, they say, is of no real help to the games player. It is the hobbyist who has a tough time finding out the technical details of the system. This book is intended for such a market: those who have fully explored the basic programming capabilities of these machines and now want to go further. As such, it deals with the internal workings of the micro- rather than the macro-computer.

Duncan and I can describe the MAJOR concepts and prove how machine code programs for that chip can be written in assembly language. They describe the hardware system and give bits and pieces of technical information of value to assembly code programmers, and go to great lengths to explain the general techniques and then make their Colgate specific — so really useful code can be derived.

The number crunching that takes place inside the kernel is in binary notation in a computer. Duran and Lam's last task. Then is to show the reader how the machine handles subtraction in two's-complement arithmetic. Unfortunately the sequences of 1s and 0s which make up binary numbers are very awkward for people to use, so when it is necessary to talk in the computer code terms a shorthand version, hexadecimal, is the compromise. Thus hexadecimal numbers are discussed along with the explanation of stack through registers and stacks. The processor can access information in a register much quickly than it can access information in a memory cell and general purpose processor registers should therefore be used to hold frequently accessed information.

The Dragon's hardware is made up of about 20 microchips and their interconnecting pins, a power supply, peripheral device connectors and so on. There is enough meat here to keep the electronics buff happy for years, and the authors set about the task with dedication. The hardware is described as if it is composed of three interconnecting subsystems, namely: the Processor, the Memory and the Input/Output System.

100

The architecture of the processor has two whole chapters devoted to its index registers, the 14 and 15 stack pointer registers, direct page registers and the 168000+ program counter are all detailed. The 168000+ data highways are 8 bits wide for first generation but some instructions operate on 16 bits which considerably increases its power and means that programs can be written using fewer instructions and executed more quickly. Because of this and the variety of ways in which memory can be accessed, the M6800 is called a second generation micro-processor or sometimes, more extravagantly, the 'programmers' dream machine'. These aspects of the M6800 machine architecture which are of importance to Design machines come away.





4) turners are given in detail in this section. A memory map is also provided.

In assembly language programming the programmer writes his program as a sequence of absolute directives to the processor. An introduction to assembly language begins by a comparison between high and low level programming. High level programming is much easier than low-level because machine architectures are inherently complex. The low-level programmer must master all these complexities to avoid programming errors, whereas using Basic or similar he could concentrate on getting right the logic of the program itself. Despite this the authors bring out some powerful reasons for using assembly language. The programmer has complete control over the machine; if he wishes to use his own particular way of manipulating characters or to access hardware features in some non-standard way this becomes possible. Assembly language is much faster than Basic by 100 to 1000 times as the translation phase is omitted. And it takes up less memory.

## Multi-stage

They give a multi-stage approach which goes from the general written solution to the problem in Basic. From here they suggest you translate it, by hand, to assembly code. This is quite a straightforward process for they give the assembly language equivalents to Basic statements in their book.

Sometimes it isn't necessary to translate the whole program into assembly code. Perhaps you have, say, a display section, where the program spends most of its time. If you include just this section the desired speed-up effect can be achieved and the machine code called from your Basic program. A whole section is devoted to achieving this.

The final stage in this sequence is to eliminate subroutines and then assemble it. This means translate it into machine code. To do this is not a difficult process as it simply requires the program to look up tables of names and associated hexadecimal values. For humans this is a slow, tedious, error-prone task but it is the kind of job computers excel at. To buy an assembler program then makes a lot of sense.

The particular assembler whose facilities are described in detail in the book is Dream (from Dragon Data) and this was also the one I used to enter the authors' demonstration programs. The assembler is easy to use and has a great variety of extra commands to simplify the creation of machine code files from assembly language text. Its editing facilities allow the user to search out and change unwanted strings, and sections of text can be marked and then replicated or saved to tape.

One problem I had with Dream was that saving the text to tape did not make a copy such that it could be subsequently re-loaded at a future date. The solution, which might be of interest to other Dream purchasers, was to POKe

give a sufficiently long leader to correct the problem. With these POKEs installed I saved a copy of Dream by DMAV8 M "MEMOPROM", 27776,32767,27776 and used this in subsequent runs.

Duncan and Ian go on to describe the labels, instructions, operands and comments fields and the way Dream handles their implementation. They show how commonly used programming constructs, such as assignments, loops and conditional statements, may be programmed in assembly language. The approach used is to take Basic statements implementing these constructs and show how assembly language equivalents to these can be built up.

The next chapter looks at more advanced aspects of assembly language programming. They describe a general-purpose technique for implementing subroutines and show how character strings may be represented and manipulated. They also tell the reader how to link such subroutines with Basic programs and how to write assembly code which is position independent.



in the section on "Subroutines and Strings" emphasis is placed on the role of subroutines in programming where the user only has to determine the solution to one problem at a time. These solutions are then integrated and co-ordinated to make the general solution — the computer program. Subroutines in Basic, however, have several drawbacks.

Program variables are global depending on the whole rather than local needs and therefore the subroutine is difficult to isolate from its environment. There is also no way that a Basic subroutine can have its own private data area which cannot be tampered with, so the programmer size never be sure that a call to the subroutine at any stage will produce the desired result. Assembly language, however, can create conditions where purely local parameters can be allowed and used along with private data areas. The 68000's architecture is shown to be well suited to the implementation of self-contained sub-

outines and the authors describe a very general way of declaring and then calling such. They also describe a calling technique which can be used when execution speed is the paramount consideration.

A useful table which lists the vector addresses with each USR call is given as follows:

USR call	USR vector
USR0	128-129
USR1	128-127
USR2	128-126
USR3	128-125
USR4	128-124
USR5	128-123
USR6	128-122
USR7	128-121
USR8	128-120
USR9	128-119

and they also state a way round the built in interpreter bug which translates every USR call as USR0. Success is gained by padding the digit with an extra zero (that is USR06, USR07 and so on). Examples of USR calls are:

```
10 DEF USR0 = +H1000 DEF USR1 = +H2000
20 A=USR0(X) Transfers control to +H1000
30 IF USR0(10)=0 THEN G=1+1
```

## Graphics

A large part of the Dragon's Basic system is dedicated to providing graphic facilities and it's not an easy task to duplicate these as machine code routines. However, the speed of Basic especially in its graphics commands is so slow that it is impossible to use an all Basic program in anything but the simplest game if it is to give any sort of challenge to the player. Once again Duncan and Ian push towards the compromise of the Basic machine code mix using the latter for time-critical parts of the program. They teach you how to design, code and animate the use of all 14 graphic and semigraphic modes. This chapter also discusses in some detail the Dragon's graphics hardware and how by reconfiguring the VDO chip all modes can be accessed.

The VDO scans the video RAM (about 60 lines) sequentially to build up an image on the screen. Although the VDO chip supports 4 different alphanumeric modes the Dragon hardware is only designed to make use of one of these. Further ROM chips need to be installed to use them and some experimentation is suggested. As well as this, Inside the Dragon discusses the display of alphanumeric alongside the semigraphic, binary, spacing to more creative possibilities to the graphics programmer. They also explain that the ROM built into VDO only holds 64 bits and that a what caused the lack of lower case on the machine.

Electronic hobbyists who want to connect their own devices to the I/O sockets are well catered for in a whole chapter on input/output programming. Data sheets from the chip manufacturers are reproduced giving complete details of chip functions and signals.

The book initially discusses the basics of



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## Connect four

From Adam Stevens in Bristol

CONNECT FOUR is a strategy game played against the Dragon. The player chooses whether to go first or second. Instructions are included in the program.

```

0 *****connect four*****
1 ***by ADAM STEVENS,***
2 ***© copyright ©1984***
10 CLS
20 DIM B(6,7),H(7)
30 DIM M(42),B(42),R(42)
40 DIM E(17)
50 CW=0;PW=0
60 CLS:PRINT:GOTO 1 INSTRUCTIONS: (Y/
N)??
70 INPUT#1:IF LEFT$(X$,1)="" THEN#0
ELSE GOSUB1350
80 CLS
90 PRINT#1#5,"PLAYER (P) OR COMPUTE
R(C)?"
100 PRINT#215,"TO START":
110 INPUT X$
120 K(0)=0:K(1)=1
130 K(2)=1:K(3)=0
140 K(4)=1:K(5)=1
150 K(6)=1:K(7)=-1
160 FOR I=0 TO 8
170 B(1,0)=9:B(1,7)=9
180 NEXT I
190 FOR I=0 TO 7
200 B(0,1)=9:B(0,1)=9
210 NEXT I
220 J=1:IF X$="C" THEN J=2
230 FOR I=0 TO 42
240 B(I)=J:J=2/J
250 NEXT I
260 T=0
270 DEF FNC(X)=32*X-16
280 DEF FMR(X)=36-32*X
290 MODE 3,1:SCREEN 1,0
300 COLOR 2,1:POLS
310 FOR I=0 TO 224 STEP 32
320 LINE(0,0)-(1,192),PSET,B
330 NEXT I
340 LINE(0,0)-(224,0),PSET
350 IF X$="C" THEN G10
360 FOR I=1 TO 7
370 IF H(I)=6 THEN G30
380 C1=1:R1=H(1)+1:P1=2:GOSUB1060
390 FOR J=1 TO 100
400 X$=INKEY$:IF X$="" THEN G50
410 NEXT J
420 PAINT(X$,Y1,1,1)
430 NEXT I
440 GOTO 360
450 T=T+1
460 H(1)=H(1)+1
470 B(1,H(1))=2
480 C2=1:R2=H(1)+GOSUB1120
490 IF V2=0 THEN G40
500 GOSUB1270
510 FOR I=160 TO 80 STEP-10
520 FOR J=20 TO -20 STEP-1
530 SOUND 1=J,1
540 NEXT J
550 FOR J=-20 TO 9
560 SOUND 1=J,1
570 NEXT J
580 NEXT I
590 PW=PW+1
600 GOTO 1290
610 C1=RND(7):IF H(C1)=6 THEN G10
620 R1=H(C1)+1
630 P1=1:GOSUB1060
640 B(1,R1)=1:H(1)=H(1)+1
650 T=T+1
660 C2=C1:R2=R1:GOSUB1120
670 IF V2=0 THEN G30
680 GOSUB1270
690 FOR I=1 TO 10
700 PLAY"LBCEB"
710 NEXT I
720 CW=CW+1
730 GOTO 1290
740 FOR C2=1 TO 7
750 IF H(C2)=6 THEN G10
760 R2=H(C2)+1
770 B(1,C2)=1
780 GOSUB1120
790 IF V2=1 THEN G30
800 B(0,C2)=0

```

Continued on page 48

```

810 NEXT C2
820 GOTO 840
830 C1=C2+R1+R2:GOTO630
840 FOR C2=1 TO 7
850 IF N(C2)=6 THEN 910
860 R2=N(C2)+1
870 B(C2,R2)=2
880 GOSUB1120
890 IF V2=1 THEN 930
900 B(C2,R2)=0
910 NEXT C2
920 GOTO840
930 C1=C2+R1+R2:GOTO630
940 FOR C2=1 TO 25
950 C2=RND(7)
960 IF N(C2)=6 THEN 1030
970 R2=N(C2)+2
980 IF R2=7 THEN 1050
990 B(C2,R2)=2
1000 GOSUB1120
1010 B(C2,R2)=0
1020 IF V2=0 THEN 1050
1030 NEXT C2
1040 GOTO 410
1050 C1=C2+R1+R2-1:GOTO630
1060 K1=FNC(C1)
1070 Y1=FNR(R1)
1080 CIRCLE(X1,Y1),R2,2+P1
1090 PAINT(X1,Y1),2+P1,7+P1
1100 SOUND 40+P1,3
1110 RETURN
1120 B2=B(C2,R2)
1130 FOR D2=1 TO 7 STEP 2
1140 X2=C2:Y2=R2
1150 C4=X2:D4=Y2
1160 X2=X2+K(D2-1):Y2=Y2+K(D2)
1170 IF X2=B(X2,Y2) THEN 1150
1180 L2=0
1190 X2=X2-K(D2-1):Y2=Y2-K(D2)
1200 IF X2>B(X2,Y2) THEN 1240
1210 C5=X2:D5=Y2
1220 L2=L2+1
1230 GOTO 1190
1240 IF L2=4 THEN V2=1:RETURN
1250 NEXT D2
1260 V2=0:RETURN
1270 LINE(FNC(C4),FNR(D4))-(FNC(C5),FNR(D5)):PSET
1280 RETURN
1290 CLS
1300 IF P#1 THEN PRINT @ 140,"YOU WON, TO GO AGAIN PRESS 'Y'"
1310 IF C#1 THEN PRINT @ 140,"YOU LOST, TO GO AGAIN PRESS 'Y'"
1320 FOR A=5314,8
1330 B4=INKEY:IF D#="Y" THEN RUN
ELSE IF D#="N" THEN 1340 ELSE 1330
1340 CLS:END
1350 DLS:PRINT" I N S T R U C T I O N S "
1360 PRINT" -----
1370 PRINT:PRINT" THIS COMPUTER V
ERSION IS JUST LIKE THE ORIGINAL
VERSION, TO MAKE YOUR COUNTER STO
P SIMPLY PRESS THE SPACEBAR, YO
U ARE THERE COUNTERS AND THE COM
PUTER IS THE BLUE ONE'S. YOU HAVE
THE OPTION TO MAKE THE COMPUTER G
O FIRST OR TO
1380 PRINT" START YOURSELF."
1390 PRINT$400," press any key to
play the game":
1400 IF INKEY#""THEN 1400 ELSE RE
TURN

```

# Directory

From M. McParlan in Cleveland

I READ in the October edition of Dragon User an article for saving programs on to a master tape, which I found very useful, but also frustrating in that I have great difficulty in getting the desired program quickly. For example, on one side of a C-80 tape I have 70 programs and to load program 15, takes 20 or so minutes. As a result I have taken the liberty of modifying the program to "directory with fast forward search.

Type in the program as listed, substituting your own files with those I have listed. CL&R& the program in the normal way by using C&R&E "DIR". Then type in next, remove the tape but do not rewind. The tape is set at the control position for loading the first item listed on your MENU. CL&R&D the first program listed on your MENU, and after CL&R&Ding replace your

"DIR" program tape and C&R&E as normal. Rewind the tape back to the beginning, then type in next.

This places your first program immediately after "DIR". Now CL&R&D "DIR", then select from your menu, item two. You will be greeted with the prompt "PRESS FAST FORWARD THEN PRESS SPACEBAR".

After following these instructions, the cassette recorder will run, then stop at the appropriate position for loading item two, followed by another prompt "PRESS THE PLAY BUTTON, THEN PRESS THE SPACEBAR". Carry out these instructions allowing the cassette recorder to run for two or three seconds before stopping it, the reason being to allow a safety margin on the tape in case it overshoots.

You can now CL&R&D item two of your MENU and repeat the procedure as for item one. Carry out this routine until your MENU is complete.

Once the menu is completed all you have to do is CL&R&D "DIR", run the program, choose from the menu and sit back while the machine searches for your program.

## Program notes

Lines

48

FOR# 350-60 slows down the listings. Also anything printed appears line by line on the screen.

Clears the screen and sets up files.

Sets up variables.

And 580-680 lists programs in menu.

And 480-580 sets up the prompts and tests for input.

If input is out of range, makes a short sound.

FOR# 250-57 speeds up the listings again and returns to page one or two as required.

On input it goes to the desired program line.

Set up prompts and tests item(1) on MENU.

GOTO lines from input. At line 370, and clears the screen. Sets up the K factor, sends the program to

50-60

70-180

170-280

280-380

370

570-610

630-1150

the GOSUB routine: on return from GOSUB clears the screen, prints title and loads program.  
GOSUB routine

2020-2030

2040-2070

Sets up the prompts and waits for response.  
Returns TIMER to 0, switches recorder motor on then switches motor off again

2080-2110

when TIMER=X.  
Sets up prompts, waits for response returns to required line and carries out loading.

2020-2100

```

10 REM*****DIRECTORY*****
20 REM WITH FAST/FORWARD ROUTINE
30 REM R.M.PARTLIN NOV-83
40 POKE 359,60
50 CLS
60 PRINT#224, STRING$(32,CHR$(172))
110 STRING$(12,"*");:DIRECTORY";STR
120 MID$(1,"*");:STRING$(32,CHR$(183));
70 FOR D=1 TO 1500:NEXT D:CLS
80 CL="PLEASE PRESS FAST FORWARD"
90 DE="ON THE TAPE RECORDER"
100 E="THEN PRESS SPACBAR"
110 F="PLEASE PRESS PLAY BUTTON"
120 G="ON TAPE RECORDER"
130 H="THEN PRESS SPACBAR"
140 P="SORRY NOTHING LISTED YET"
150 J="PLEASE WAIT"
160 C=1950:1960:222
170 CLS
180 PRINTSTRING$(14,"*");:MENU";ST
190 RING$(14,"*");:STRING$(32,CHR$(183))
190 PRINT#75," "
200 PRINT "1.GRAPHIC DEMO"
210 PRINT "2.GRAPHIC DEMO"
220 PRINT "3.GRAPHIC DEMO"
230 PRINT "4.GRAPHIC DEMO"
240 PRINT "5.CLOCK"
250 PRINT "6.SPACE FOR NEW T
260 PRINT "7.-----"
270 PRINT "8.-----"
280 PRINT "9.-----"
290 PRINT"PLEASE SELECT ONE OF THE
300 PRINT"OR PRESS ENTER FOR NEXT
310 PAGE"
320 INPUT N
330 IF N=0 THEN 360
340 IF N=9 THEN 34 ELSE 360
350 SOUND 200,4:POKE 359,57
360 GOTO 190
360 POKE 359,60
370 DN N:GOTO 570,620,650,680,710,
740,780,820,850,910,960,1000,1040,
1060,1080,1100,1130,1140
380 FOR I=1000 TO 1479:POKE I,143:NEXT I
390 PRINT#75,"PAGE TWO"
400 PRINT "10.-----"
410 PRINT "11.-----"
420 PRINT "12.-----"
430 PRINT "13.-----"
440 PRINT "14.-----"
450 PRINT "15.-----"
460 PRINT "16.-----"
470 PRINT "17.-----"
480 PRINT "18.-----"
490 PRINT"PLEASE SELECT ONE OF THE
500 PRINT"OR PRESS ENTER FOR PAGE
510 ONE
520 POKE 359,60
530 INPUT N
540 IF N=0 THEN 540 ELSE 540
550 IF N<10 OR N>18 THEN 550 ELSE
570
550 SOUND 200,4
560 POKE 359,57:GOTO 370
570 CLS:PRINT#75," "
580 DE="INKEY$;"P4=" " THEN 590 CLS
590
590 CLS:PRINT#75,"LOADING DEMO"
600 PRINT#75:PRINT#75,SCREEN$,1:LOAD
610 SCREEN$,1:LOAD
620 CLS:X=10:GOSUB 2000
630 CLS:PRINT#75,"LOADING DEMO"
640 PRINT#75:PRINT#75,SCREEN$,1:LOAD
650 CLS:X=20:GOSUB 2000
660 CLS:PRINT#75,"LOADING DEMO"
670 PRINT#75:PRINT#75,SCREEN$,1:LOAD
680 CLS:X=28:GOSUB 2000
690 CLS:PRINT#75,"LOADING DEMO"
700 PRINT#75:PRINT#75,SCREEN$,1:LOAD
710 CLS:X=35:GOSUB 2000
720 CLS:PRINT#75,"LOADING"
730 PRINT#75:PRINT#75,SCREEN$,1:LOAD
740 CLS:X=44:PRINT#75,P4="
750 FOR N=11000:NEXT:GOTO 170
760 CLS:PRINT#75,"LOADING "
770 PRINT#75:PRINT#75,SCREEN$,1:LOAD
780 CLS:X=51:PRINT#75,P4="
790 FOR N=11000:NEXT:GOTO 170
800 CLS:PRINT#75,"LOADING "
810 PRINT#75:PRINT#75,SCREEN$,1:LOAD
820 CLS:X=60:PRINT#75,P4="
830 FOR N=11000:NEXT:GOTO 170
840 CLS:PRINT#75,"LOADING "
850 PRINT#75:PRINT#75,SCREEN$,1:LOAD
860 CLS:X=72:PRINT#75,P4="
870 FOR N=11000:NEXT:GOTO 170
880 CLS:PRINT#75,"LOADING"
890 PRINT#75:PRINT#75,SCREEN$,1:LOAD
900 CLS:X=84:PRINT#75,P4="
910 FOR N=11000:NEXT:GOTO 170
920 CLS:PRINT#75,"LOADING"
930 PRINT#75:PRINT#75,SCREEN$,1:LOAD
940 CLS:X=90:PRINT#75,P4="
950 FOR N=11000:NEXT:GOTO 170
960 CLS:PRINT#75,"LOADING"
970 PRINT#75:PRINT#75,SCREEN$,1:LOAD
980 CLS:X=97:PRINT#75,P4="
990 FOR N=11000:NEXT:GOTO 170
1000 CLS:PRINT#75,"LOADING"
1010 PRINT#75:PRINT#75,SCREEN$,1:LOAD
1020 CLS:X=105:PRINT#75,P4="
1030 FOR N=11000:NEXT:GOTO 170
1040 CLS:PRINT#75,"LOADING"
1050 PRINT#75:PRINT#75,SCREEN$,1:LOAD

```

Continued on page 43

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```

1040 CLS: X=100:PRINT@,P@;
1050 FOR H=1 TO 500:NEXT @GOTO170
1060 CLS: X=110:PRINT@,P@;
1070 FOR H=1 TO 500:NEXT @GOTO170
1080 CLS: X=120:PRINT@,P@;
1090 FOR H=1 TO 500:NEXT @GOTO170
1100 CLS: X=130:PRINT@,P@;
1110 FOR H=1 TO 500:NEXT @GOTO170
1120 CLS: X=121:PRINT@,P@;
1130 FOR H=1 TO 500:NEXT @GOTO170
1140 CLS: X=127:PRINT@,P@;
1150 FOR H=1 TO 500:NEXT @GOTO170
2000 REM FAST FORWARD SUBROUTINE

```

```

2010 REM -----
2020 PRINT@,CL,"  "DB,"  "E@
2030 AH=INKEY$:IF AH="  "THEN2040 CL
2040 CL:PRINT@,CL
2050 CLS:PRINT@,JE
2060 PRINT@,CL,"SEARCHING"
2070 IF TIMER/50=X THEN2080 ELSE 2
070
2080 MOTOR OFF
2090 CLS:PRINT@,FL,"  "GB,"  "H @
2100 AH=INKEY$:IF AH="  "THEN2110 E
LSE2100
2110 RETURN

```

# Mash

From Ian Masham and Julian Chapman in Northampton

This PROGRAM is the revised version of Mash that appeared in the April 1984 edition of Dragon User (Open File, page

50). The idea is to safely land your damaged helicopter on the landing pads. Instructions are given with the program and the keys must be repeatedly pressed to control movement.

```

0 GOTO170
10 PROGB,1,1:SCREEN1,1:PCLS
15 DRAW@B@,1:200:200:70,0:250"
20 DRAW@B@,1:40:1:40:100:200:100:100
100:100:100:100:100:100:100:100:100:100
40:100:100:100:100:100:100:100:100:100
40
50 GOTO170
60 DRAW@B@,1:200:200:100:100:100:100:100
100:100:100:100:100:100:100:100:100:100
100:100:100:100:100:100:100:100:100:100
40
70 PRINT@110,110,1,1
80 PLAY"14"
90 PLAY"15"
100 PLAY"16"
110 PLAY"14"
120 PLAY"17"
130 FOR H=1 TO 2
140 PLAY"14:AB-A"
150 PLAY"14:20"
160 PLAY"14:20"
170 PLAY"14:FL@"
180 PLAY"14:GF@"
190 PLAY"14:FL,00"
200 PLAY"14:FE"
210 PLAY"14:10"
220 PLAY"14"
230 PLAY"14:AL40"
240 PLAY"14:DC"
250 PLAY"14:CL40"
260 PLAY"14:DC"
270 PLAY"14:CL40"
280 PLAY"14:DC"
290 PLAY"14:DC"
300 PLAY"14"
310 PLAY"14:LL40"
320 NEXT H
330 PLAY"14"
340 PLAY"14:LL40"
350 PLAY"14:DC"
360 PLAY"14:DC"
370 PLAY"14:DC"
380 PLAY"14:DC"
390 PLAY"14:DC"
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800 PLAY"14:DC"
810 PLAY"14:DC"
820 PLAY"14:DC"
830 PLAY"14:DC"
840 PLAY"14:DC"
850 PLAY"14:DC"
860 PLAY"14:DC"
870 PLAY"14:DC"
880 PLAY"14:DC"
890 PLAY"14:DC"
900 PLAY"14:DC"
910 PLAY"14:DC"
920 PLAY"14:DC"
930 PLAY"14:DC"
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950 PLAY"14:DC"
960 PLAY"14:DC"
970 PLAY"14:DC"
980 PLAY"14:DC"
990 PLAY"14:DC"

```

Continued  
on page 44

```

16R3UBF4R10F2L15+
&90 NEXTC
700 COLOR=5
710 LINE(51,162)-(61,162),PSET
720 LINE(124,167)-(135,167),PSET
730 LINE(198,174)-(212,174),PSET
740 COLOR=0
750 X=230:Y=7
760 S=S
770 M=M
780 FORN=0 TO 5
790 GOTO120
800 A$=INKEY$:IF A$<>" THEN GOSUB
60
810 NEXTH
820 Y=Y+1
830 S=S-1
840 IFS=0 THEN S=S
850 GOTO780
860 IF FU=19 THEN RETURN
870 IF A$="R" THEN S=S+1:IFS=1 THEN
S=S
880 IFS>10 THEN S=S-1
890 IF A$="T" THEN W=W-.1:IF W<0 TH
EN W=0
900 LINE(FU,3)-(FU,S),PSET:FU=FU
+1
910 RETURN
920 IF A$<>"R" THEN W=W+.05
930 IFS=1 THEN W=1
940 X=X-W
950 IF X<1 THEN PUT(X,Y)-(X+10,Y+10
),V,PSET
960 IF POINT(X,Y+10)=5 OR POINT(X
+8,Y+10)=5 THENPS=
970 PUT(X,Y)-(X+10,Y+10),I,PSET
980 GOTO800
990 X=INT(RND*Y)INT(Y)
1000 IF Y=152 OR Y=161 OR Y=154 OR
Y=162 THEN 1610 ELSE 1620
1610 IF X=50 OR X=51 OR X=124 OR X
=125 OR X=197 AND X(200)=1 THEN 1700
ELSE 1630
1620 R$="YOU CRASHED! -YOUR PATIENT
T AND AND CREW WERE KILLED"
1630 PUT(X,Y)-(X+10,Y+10),E,PSET
1640 PLAY"125501"
1650 FORN=31 TO 0 STEP-1
1660 PLAY""+STR$(Y)+"DACCDEFDA"
1670 NEXTV
1680 SCREEN=0
1690 CLS
1700 PRINT#
1710 GOTO1770
1720 PLAY"12BADA8ADABBAWBABDBDBDB
BR"+GOTO1750
1740 SCREEN=0
1750 CLS
1760 PRINT"WELLDONE YOU SAVED YOUR
PATIENT"
1770 PRINT:PRINT"YOU HAD'FU'-19'UND
IS OF FUEL LEFT"
1780 FORN=0TO2800:NEXTH
1790 PRINT:PRINT:INPUT"WOULD YOU L
IKE TO TRY AGAIN?";A$:IFA$="Y" THEN
RUN
1800 CLS:END
2000 CLS3:PRINT"THE OBJECT OF THE
GAME IS TO SAVE YOUR PATIENT BY LA
NDING YOUR"
2100 PRINT"DAMAGED HELICOPTER ON T
HE LANDING SPOTS"
2200 PRINT:PRINT"THERE IS A STORM
AND A GREAT WIND"
2300 PRINT:PRINT"A TO THRUST AGAIN
ST THE STORM"
2400 PRINT:PRINT"S TO THRUST AGAIN
ST THE WIND"
2450 PRINT:PRINT"WATCH OUT FOR THE
AIRCRAFTS "
2460 PRINT"THEY COULD HAVE MISSILE
S AND DE-STROY YOU,PRESS A KEY"
2600 IF INKEY$="" THEN 2600
2700 RETURN

```

## Robert H. Livingston, Jr., Seattle

**Abstract**



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460-500  
510-550

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- Sets up variables and closes screen.
- Prints and flashes "FACON" five times.
- Main loop.
- Detects when no oil left.
- Plays low oil warning when oil is less than 95 units.
- Detects keys pressed.
- Loops the routine.
- At more lives left.
- Stops computer.

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40-49	65%
50-59	60%
60-69	55%
70-79	50%
80+	45%

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- Leaves left.
- Oil left.
- Amount of mole hills.
- Counter.
- Note position on scales of miner.
- Direction of movement.
- Detects whether miner has hit anything or not.
- Speed level.
- Timing loop to slow game down after TL = 1 TO K; (see p. 11).





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If you've got a technical question write to Brian Cudge. Please do not send a SASE as Brian cannot guarantee to answer individual inquiries.

## Dragon Answers

### Floppy format

I RECENTLY purchased a Dragon 64, and am trying to connect it to a DEC Rainbow via its RS232C port so that I can use the floppy storage of the Rainbow.

Can you tell me what is the character format required by the Dragon 64 after the commands BLOAD or DLOAD have been executed?

After two characters, the Dragon responds with "IO ERROR".

W.J. Ward  
Buckingham  
Cheshire

THE BLOAD command is, unfortunately, completely undocumented, although it is potentially very useful. In fact, the format for BLOAD (and DLOAD) is exactly the same as for CLOAD (and CLOADM).

The very same ROM routines are used except that the channel used is the RS232C port (channel 3 internally). Assuming you want to use DLOADM (as this is the most obvious way of loading data) the format required for a block is 128 bytes of 100, 132, a block type byte, a block length byte, up to 255 data bytes, a checksum byte, 000.

In addition, the first block read must be a standard nameless block as used in the cassette system.

### PMODE problem

I HAVE owned a Dragon 32 for nearly a year and am very pleased with its performance. However, there are slight drawbacks. In hi-res, colours cannot be obtained in PMODE4. Also, text cannot be printed on to the hi-res screen.

I have, however, heard of a mode 24. This, I believe, means that all nine colours and text can be used on the screen in hi-res. Could you please give me more information on this.

Roger Paine  
Alford  
Worcestershire

THE MODE that I think you mean is called Semigraphics 24. This allows normal text to be displayed as well as graphics on a grid



of 84-192 in all eight colours. Unfortunately, this mode is not supported from Basic; to enter and control it you have to use POME. The following will enter Semigraphics 24, with the top left of the screen starting at address 1024:

```
POME SHFFS:0 : POME  
SHFFC0: POME SHFFS:1
```

To display a character on the screen its code must be poked to 12 columns consecutive addresses, so to display "A" in the top left-hand corner you would use:

```
POR 1-8 to 11 : POME  
1024-1*32,ASC("A") NEXT  
To display graphics, the code of the graphics character must be poked into one address (for example, to substitute the A in yellow use: POME 1024-1*32, 108).
```

### String error?

HAVE I found a BASIC ROM weakness error?

When creating a string data file, some of the data was required within double quotes character (CHR\$(34)). As long as the first character of the data was not a double quote, there was no problem.

However, when the data field commenced with a double quote character, although apparently saved without problem, reading the data back in gave an FD error.

I have never seen any restriction on the contents of a string field. Any Answers?

Pam D'Arcy  
High Wycombe  
Bucks

YOU have raised an interesting point here, and are quite correct in thinking that the data is saved to tape without alteration.

However, the problem arises when reading this back into a program using INPUT#. The same ROM routines that are used for an input from the keyboard are called, except that data is taken from the cassette buffer.

The assignment routine looks for an optional opening quote as the first significant character in the field. If one is found, it is assumed to mark the start of a special string (containing commas, colons and so on) and does not form part of the string itself.

The FD error is caused when the closing quote is read — this is assumed to mark the end of the string and a CHR\$(13) is expected immediately after this. If any other character is found then the data is faulty.

There is no simple way around this problem except to ensure that quotes (if they must be included in a string) do not form the first significant character in the line. Alternatively, substitute another character for the quote before saving and convert back after loading.

### Missing pieces

I AM currently writing a program which involves using the "GET" and "PUT" commands, but am experiencing difficulties. I am familiar with keeping the picture or object within the sixty-dimension (DIM) but the trouble arises when I try to use "HOLDYS" and replace the co-ordinates with variables such as "X". The object on the screen will move correctly about twice and then start to move quite large parts out.

Could you please write a small

program for me which moves, say a small square around the screen when you press the appropriate key, stop when you hit go and will not jump out or interfere with the background.

Carl Coester  
Leiston  
B. Herts

An example program might look something like this:

```
10 PMODE 3,3:COLOR 2,1:  
POLYDRAWN:0  
20 LINE (3,3)-(9,9),PUT:0  
30 DIM A(13):GET(0,0)-  
12,22:A,0  
40 POLYD-12,7-90  
50 PUT (X,Y)-(0-22,  
7-22),A,PUT  
60 IS = INKEY$  
70 X=X+(IS=CHR$(81))*2-  
10-CHR$(81)*2  
80 Y=Y+(IS=CHR$(84))*2-  
10-CHR$(84)*2  
90 GOTO 30
```

Note that this program does not check whether the object reaches the edge of the screen, but merely demonstrates the use of the GET and PUT commands which are amongst the most powerful graphics commands available on the Dragon.

### Unwanted saving

LIVABLE in Belgium and being the owner of a Dragon, I soon discovered the problem of obtaining information and software.

I tried to link an Epson MX-80 P/T printer to my Dragon using a "terminal" printer cable.

Everything worked, but the entire LIST was printed on the same line. It's not a save paper but ... what must I do?

There are no switches on the printer, so could you please tell me if the Epson works with the Dragon?

Joan Flament  
Belgium

HARD is a problem in the Dragon Range for problems like this one with printers. The following should be typed when you first turn on the computer:

```
POME 105, 80  
POME 154, 54  
POME 235, 0  
POME 235, 2
```

This tells the computer to send both a carriage return and a line load code at the end of every line printed. On some printers it may not be necessary to use the last poke command.

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# Competition Corner

Answers to Competition Corner,  
Dragon User, 12/83 Little Newport  
Street, London WC2R 2LU

THE AMAZING popularity of the Rubik Cube has brought in its wake an interest in a diversity of similar puzzles — double cubes, Rubik tetrahedra, larger orders of cubes, computer versions (Dragon User March 84) and, no doubt in the future, the four-dimensional cube is not far away.

Along with the actual puzzles themselves, comes a branch of mathematical theory which, for want of a better name, can be termed Rubik-ontology. The fundamental question of Rubik-ontology might well be: "How many different arrangements are possible on the Rubik cube?" To answer this, consider the cube.

## Pieces

It comprises eight corner pieces, 12 edge pieces and six centre pieces. Now each of the eight corner pieces can be placed at the eight possible corner positions on the cube, so there is a total of eight (factorial eight) ways in which this can be done. Further, each of these corner pieces can be fitted into one of three orientations in each given corner. If you have a dismantled Rubik cube to hand you can easily see how this works. So our eight ways of arranging the corners must be further multiplied by  $3^8$  to take into account this rotation.

Similarly, the 12 edge pieces can be fitted into their respective vacant spaces in 12! ways. These pieces too, can be placed in one of two different orientations, so we have to multiply  $12!$  by  $2^{12}$ . Thus, our grand total will be  $8! \cdot 3^8 \cdot 12! \cdot 2^{12}$ . This gives us a 18004032096768270080 — the total number of ways in which the cube can be re-assembled. Who would have thought that such a gigantic number could relate to a few pieces of plastic?

You may have wondered why no account has been taken of the blocks which occur in the central position on each face of the cube. In fact, no matter how the cube is twisted these six blocks always remain stationary with respect to one another. This may be difficult to imagine, but if you have dismantled a cube, you will find that these six blocks are fitted to a central axis, around which all the other blocks rotate, and their relative position to each other is fixed and remains constant.

# Printer power

Answer Gordon Lee's quest to win Brother's thermal printer



Having arrived at our grand total, it might be supposed that any one of these positions could arrive during use. This is not so, as it has been found that only one twelfth of the positions can possibly occur during actual play. Even so, this still represents an enormous number of possibilities. In fact, there exist 12 completely different "cycles" each containing some 43252003274489856000 positions, and although it is possible to arrive at any position within each particular "cycle", it is impossible to move from one "cycle" to the next. For this reason it is advisable when re-assembling the cube to assemble it in its completed position, otherwise if it is put together at random, there will only be one chance in 12 that the puzzle can ultimately be solved.

This month's competition concerns Professor Gulek and Professor Rubik, those learned experts of ontology who have just announced plans for the last Rubik Cube Olympics, which they hope will take place somewhere in the United States.

At first, there was some difficulty in

deciding on the venue, but, following the policy that in ontology all factors should, where possible, have cubic connections, only those States which could be said to be "cubic" were considered.

## Substitute

For example, by substituting digits for the letters of the name "Utah", the professors were able to find 4096 — the cube of 16 — each different letter being represented by a different digit. Similarly, "Nevada" is also a possibility — this time with 157440 — the cube of 54. Note that here the fourth and sixth digits are the same to match up with the two "A's" in Nevada, the other digits being different.

As a guide, only those States with names having nine letters or less, and consisting of one word were considered. However, it was pointed out that such Olympics could only be held during a "cubic" year, so the plans have had to be delayed until 2107, the next such date that which States were on the Professors' list?

## Prize

IF YOU'VE always wanted to add a printer to your Dragon — now's your chance. Brother is offering its HL-5 thermal transfer printer to the winner of this month's competition.

The HL-5 gives users a wide range of options: regular, condensed or expanded typefaces; mains or battery operation; and A4 or roller paper. A dot matrix model, the printer operates at 30 characters a second over 80 columns — and can produce uni-directional graph and chart images together with bi-directional text.

## Rules

TO WIN this month's prize you must show both the answer to the competition and how to solve it with the use of a Basic program developed on your Dragon. Please do not send in a cassette containing the answer. As a tie-breaker complete the following sentence in 15 words or less: "I want to add a Brother printer to my Dragon because..."

Your entry must arrive at Dragon User by the last working day of July. The winner and the solution to the puzzle will be published in our October issue. Entries will not be acknowledged

and we cannot enter into correspondence on the result. You may only enter the competition once.

## April winner

THE WINNER of April's competition and recipient of a Sekosha printer from ORO Business Systems is Roger Erving of Alverstoke in Dorset.

Roger was one of the few people who correctly answered that cubes of sides 2, 4, 5 and 11 inches produce 761 painted and 761 unpainted unit cubes giving a total of 1,522 small cubes from 4 large cubes.

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